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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/500,624	07/02/2004	Takashi Miyazaki	Q82011	3009
65565	7590	05/15/2007		
SUGHRUE-265550			EXAMINER	
2100 PENNSYLVANIA AVE. NW			GARNER, ONDRIA L	
WASHINGTON, DC 20037-3213				
			ART UNIT	PAPER NUMBER
			2834	
			MAIL DATE	DELIVERY MODE
			05/15/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/500,624	Applicant(s) MIYAZAKI ET AL.	
	Examiner Ondria Garner	Art Unit 2834	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 February 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) ^{1, 3-5}~~1-5~~ is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1 and 3-5 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>7/2/2004</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Specification

The Examiner has accepted the changes to the title.

Information Disclosure Statement

The information disclosure statement (IDS) submitted on 03/01/2007 was filed after the mailing date of the Non-Final Office Action on 11/22/2006. The submission is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1 and 3-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Arai et al (6873081) in view of Nishikawa et al (6252323) and Daikoku et al (JP 2002136003). Arai teaches in figures 30A and 30B a permanent magnet electric motor comprising a stator iron core of cylindrical shape provided with a stator winding for producing a rotating magnetic field causing said rotor to be rotated. Arai does not teach the rotor having two stages or the stator iron core being divided into blocks.

Nishikawa teaches in figures 3, 4, and 11 a rotor having an upper stage permanent magnet and a lower stage permanent magnet provided in an axial direction on an outer circumferential face of a rotor iron core, and said lower stage permanent magnet shifted from said upper stage permanent magnet by a first stage skew angle θ_r with respect to a center line passing through said upper and lower stage permanent magnets to decrease a frequency component of a cogging torque in a circumferential direction of said rotor iron core. It would have been obvious to one of ordinary skill in the art at the time of the invention to have a rotor provided with two stages in order to reliably decrease cogging torque.

Daikoku teaches in figure 1, a stator core divided into plural blocks in the axial direction and shifted by a second stage skew angle θ_s . It would have been obvious to one of ordinary skill in the art at the time of the invention to have a stator core divided into plural blocks in order to suppress torque ripples without degrading the characteristics of the stator.

Arai teaches the axial length of said stator iron core is L_c (m), and the theoretical angle of said first stage skew angle θ_r (.degree.) is an electrical angle θ_s (.degree.), the following expression is satisfied, $\theta_t = (360 \text{ degree} / \text{least common multiple of the number of stator magnetic poles and the number of rotor magnetic poles}) / 2$ (1). $\theta_t < \theta_r < (700 \times 10^3 / L_c + \theta_t)$ (2) .

Referring to claim 3, Arai teaches all of the claimed features as discussed above. Arai does not teach the stator blocks. Daikoku teaches in figure 1, a stator having a stator iron core divided into the first, second and third stator blocks in the axial direction;

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and, said second stage skew angle θ_s is provided between said first stator block and said second stator block, and between said second stator block and said third stator block. It would have been obvious to one of ordinary skill in the art at the time of the invention to have a stator core divided into plural blocks in order to suppress torque ripples without degrading the characteristics of the stator.

Referring to claim 4, Daikoku teaches in figure 8 a clearance L_{cg} (13) is provided between said first stator block and said second stator block, and between said second stator block and said third stator block, such that the inequality $0 < L_{cg} < 2.2 \text{ gm}$ holds. It would have been obvious to one of ordinary skill in the art at the time of the invention to have a clearance between the first stator block and said second stator block, and between said second stator block and said third stator block in order to prevent the generation of invalid magnetic flux.

Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Arai, Nishikawa and Daikoku in view of Prymak (4616151). Arai, Nishikawa and Daikoku teach all of the claimed features including a stator with multiple blocks. Arai, Nishikawa and Daikoku do not teach a fourth stator block in the axial direction. Prymak teaches in figure 1, a fourth block in the axial direction and a skew angle being provided between the first, second, third and fourth stator block. It would have been obvious to one of ordinary skill in the art at the time of the invention to have a fourth stator block in order to reduce the excitation modes and thus produce quieter motor operation.

Response to Arguments

Applicant's arguments filed 02/22/2007 have been fully considered but they are not persuasive. Referring to claim 1, as stated in the previous Office Action, Arai provides evidence that the expression, as described by the applicant, is a result effective variable see MPEP 2144.05, II. Although Arai does not explicitly teach the expression, it is taught in column 18, line 25 et al. It would have been obvious to one of ordinary skill in the art at the time of the invention to satisfy the equation provided by the applicant, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). Therefor the Examiner reaffirms the rejection of claim 1.

Referring to claims 2-4, applicant argues that Daikoku does not disclose a clearance. These arguments are not persuasive in that Daikoku teaches in figure 8, the clearance 13 and 18 between stator blocks. Since the applicant did not specify a circumferential or axial clearance, the Examiner as pointed out both in Daikoku. Figure 9 teaches a gap between the stator and the rotor. As stated above all expressions that are pointed out by the applicant are result effective therefor the Examiner reaffirms the rejection of the claims.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. US 20020130580, US 20040084985, US 6008559.

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

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A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ondria Garner whose telephone number is 571-272-8327. The examiner can normally be reached on Monday through Friday, 8:00 am to 4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Darren Schuberg can be reached on 571-272-2044. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

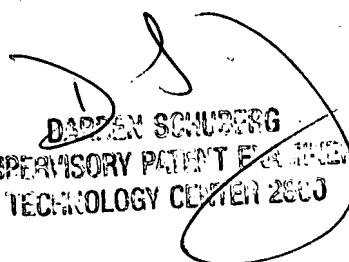
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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



OLG

5/7/2007



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